

Remarks

Claims 1 has been amended, claims 4 and 5 have been canceled, claims 7-10 have been withdrawn, and claims 11-14 added. Claims 1-3, 6 and 11-14 remain in the application. Reconsideration of the rejections and objections at an early date is requested.

The examiner objected to the drawings for omitting critical parts of the claimed invention. Substitute drawings are submitted herewith in order to be responsive to the examiner's concerns. New figures 4 and 5 illustrate schematically that there is a motor 40 driving an axis 17 that turns the pivoting part 14. Figures 3 and 4 clearly illustrate the location of camera 23 with respect to the pickup elements 6 and more clearly show the optical path from camera 23 to the substrate. Fig. 4 especially shows how the optical path is unobstructed when the pivoting part is rotated 90 degrees.

The examiner rejected claims 1-6 under 35 U.S.C. 112, first paragraph, saying the specification does not enable the invention. Applicant submits that Figs. 4 and 5 better illustrate how the pivoting part is turned and controlled, but submit that this would be understood by one skilled in the art and that no new matter is added by including these figures and the related descriptions. The amendment to the specification also makes clear that the items 15 are not elements but simply directional arrows that show the rotation of the pivoting part and make apparent to one skilled in the art that some motive means would be turning the pivoting part.

The examiner rejected claims 1-6 under 35 U.S.C. 112, second paragraph, as being indefinite. Claim 1 has been rewritten so that the elements of the invention are clearly stated. It

is submitted that amended claim 1 clearly sets forth and claims the invention wherein the pivoting part carrying the pickup elements rotates continuously, and during a portion of that rotation presents a clear optical path for the camera or optical inspection device to examine the substrate from which the electronic elements are being picked up by the pickup elements. In the rotation of the pivoting part through either 180 degrees or 360 degrees, the pivoting part will necessarily pass through 90 degrees and/or 270 degrees.

Claims 1-6 were rejected under 35 U.S.C. 103(a) as being unpatentable over Morita (U.S. Patent No. 5,233,745). However, Morita does not disclose any through opening. The through opening is the basic and main feature of the present invention, since this through opening enables the camera to examine the substrate without obstruction during a portion of each half-rotation of the flipping head without stopping the flipping head. By using this principle the machine is capable of rotating faster than all machines which are known by Applicant.

In Morita, the camera 50 is capable of observing the element once it is picked up. This kind of camera can not inspect the position of the element or the chip on the wafer or substrate from where it is to be picked up. But this is an object of the present application, namely that the camera can inspect the element or chip on the wafer of substrate before it is picked up, in order to determine the right position of the chip or the substrate with regard to the pick up element.

In Morita, the camera (50) inspects the second electronic component, which is at the second nozzle while the first electronic component is facing to the first nozzle (see column

6, last paragraph of the Morita reference). This means that there is no through opening according to the main claim of the present application. Rather the camera (50) is capable of monitoring the electronic component P1 (see figure 4), which is on the upper side of the flipping head (see column 6, lines 10 –14, of Morita).

The method or process of the Morita citation is as follows:

1. Pick up the electronic component and hold it at the nozzle during the rotation and make a 180° rotation.
2. After the electronic component has reached the upper position, it is inspected by the camera (50) while the component is being held by the nozzle.
3. After the inspection the electronic component is transferred away from the nozzle.

This method or procedure as described in Morita has the disadvantage that each electronic component is picked up, independent of the quality of the component. In comparison, according to the present invention an inspection by the camera is performed before the electronic component is picked up from the substrate. The result is that electronic components with a bad quality are not picked up by the pickup elements in the present invention. Rather, the substrate is positioned to another position, in order to offer a new electronic component, which is inspected by the camera during the rotation of the flipping head or pivoting part before the component is selected and picked up. When the camera has recognized that a good quality component is positioned on the substrate, the pick-up element picks up this electronic component and transfers it upward and away from the substrate by a

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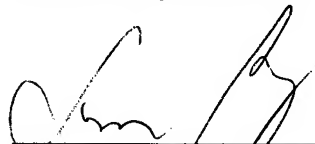
180° rotation. During this procedure the flipping head is rotated 180°, even if no electronic component is picked up.

In conclusion, the construction of the Morita reference is completely different does not accomplish the purposes as the construction of the Applicants' invention. Thus, claim 1 is not obvious over Morita, and, therefore, claims 1-3 and 6 should be allowed.

New claims 11-14 claim the pickup and rotating device, for use with an optical inspection device, as described in the specification. These claims should be allowable for the same reasons as set forth above for claims 1-3 and 6.

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Respectfully submitted,



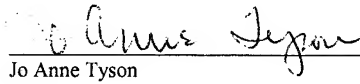
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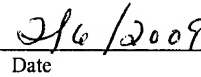
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